

**Listing of Claims:**

1. (currently amended) A microfluidic sieve comprising:  
a substrate having a microfluidic channel; and  
a compressed carbon nanotube mesh comprising a plurality of intertwined free-standing carbon nanotubes fixedly attached within and randomly extending from the surface of said channel to form irregularly sized mesh pores between the intertwined nanotubes for separating, concentrating, and/or filtering molecules flowed therethrough; and  
a cover layer sealably capping said microfluidic channel to thereby pack and compress the carbon nanotube mesh in the microfluidic channel,

wherein said mesh partially fills a cross-section of the channel to form a central gap therethrough.

2-8. (canceled)

9. (original) The microfluidic sieve of claim 1,  
wherein the surfaces of said carbon nanotubes are functionalized to chemically select/  
discriminate molecules.

10. (original) The microfluidic sieve of claim 9,  
wherein the surfaces of said carbon nanotubes are functionalized with a nanotube coating.

11. (original) The microfluidic sieve of claim 10,  
wherein the nanotube coating comprises a chemical derivatization.

12. (original) The microfluidic sieve of claim 1,  
wherein said carbon nanotube mesh has irregularly sized mesh pore sizes of 10 to 200  
nanometers.

13. (original) The microfluidic sieve of claim 1,  
wherein said substrate is a patternable material with said microfluidic channel etched as a groove  
thereon.

14. (canceled).

15. (currently amended) The microfluidic sieve of claim 1 ~~[[14]]~~,  
wherein the cover layer is anodically bonded to said substrate.

16. (canceled)

17. (original) The microfluidic sieve of claim 1,

wherein said substrate has at least one more of said microfluidic channel and a corresponding carbon nanotube mesh fixedly attached therein.

18. (original) The microfluidic sieve of claim 1,  
further comprising at least one securing nubbin positioned in said channel to prevent the dislocation of said carbon nanotube mesh.

19. (original) The microfluidic sieve of claim 18,  
wherein said securing nubbin(s) is a microfabricated post adjacently positioned downstream of said carbon nanotube mesh.

20-46. (cancelled)